Drop 13. E. M., æt. 48, Cherokee Indian, born in Florida, U. S. Average 1–3215, maximum 1–2857, minimum 1–4000. Eighty-three per cent. fell between limits stated above, 10 fell below, and 7 exceeded them.

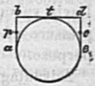
Drop 14. J. R., æt. 40, white male, born in Pennsylvania, U. S., of English parentage. Average 1–3191, maximum 1–2777, minimum 1–3846. Eighty-five per cent. came within limits mentioned, 6 fell below, and 9 above them.

Combining these deductions, we find that of the whole 1400 corpuscles each separately measured, the average was 1–3224 (.007878 mm.), the maximum 1–2777, and the minimum 1–4000 of an inch; 1158 or 83 per cent. measured between 1–3448 and 1–3030 of an inch in diameter, and consequently under a power of 200 would appear about the same magnitude; 118 or about 8 per cent. were less than 1–3448, and 124, or nearly 9 per cent. were more than 1–3030 of an inch in diameter. The total number of corpuscles 1–4000 of an inch across was 6, or less than one-half of one per cent. The total number 1–2777 of an inch in diameter was 10, or less than one per cent.

The somewhat smaller averages of the Italian, Swedish, and Norwegian specimens are perhaps due to slight accidental variations in spreading out the layers of blood for examination, and cannot be accepted, at least without further research, as indicative of either personal or national peculiarities.

Such minute differences indeed must be expected with our present methods of observation, and it seems to me that, taken as a whole, my results powerfully confirm the Scriptural declaration, that the Lord "made of one blood all the nations of the earth."

ART. XVI.—*Ophthalmic Contributions*. By GEORGE STRAWBRIDGE, M.D., of Philadelphia. (With a wood-cut.)



I. *Modified Flap Extraction Operation.*—In a report of some forty recent cases of cataract extractions, published in the *Philadelphia Medical Times* of February 19, 1876, I referred very briefly to an operation which was designated as the "Modified Flap Operation." Since then my experience in this operation has been considerably enlarged, and with most gratifying results. If a circle be drawn having a radius of 6 mm., (*vide* Fig.), it will closely represent the size of the cornea. Now, if the line *b d* be drawn tangent to the vertical diameter of the cornea, as represented by the circle, and the lines *b a* and *d e* be drawn tangent to the horizontal diameter, two triangles will be formed by the intersection of these three lines, *a b t* and *e d t*, which triangle practically represents the most available ground for the puncture and counter-puncture of any incision that may be made for lens extraction. In fact, the puncture and counter-puncture must closely follow the lines *a b* and *e d* to form an opening sufficiently large for the lens exit. (The same rule would hold good for the inferior operation.)

The centre of an incision, whether a flap or a lineal cut, should be tangent to the corneal margin, for two important reasons: The greater completeness of the iridectomy, a proceeding generally admitted as greatly increasing the success of the operation; and, secondly, the greater ease attending the lens removal and the escape of any cortical remnants that may be left.

In regard to the puncture and counter-puncture. The nearer the points *b* and *d* are approached, the greater the risk of ciliary inflammation; while, on the other hand, the points *a* and *e* necessitate a large corneal flap, and great risk of corneal suppuration. Therefore the points *p* and *c* have been chosen as midway between these two dangers; they being at a distance of 0.5 mm. from the corneal border, and 3 mm. below a line tangent to the superior corneal border.

Method of Operation. 1st Stage.—A Graefe knife, held horizontally, enters the eyeball at a point 0.5 mm. from the corneal border and 3 mm. below a line tangent to the superior corneal border. The counter-puncture is made at a corresponding point on the other side of the cornea, and the incision completed so as to form a tangent to the superior corneal border, the eyeball being held by fixation forceps. This incision forms an opening of 10–11 mm., amply sufficient for the exit of any lens—the ordinary lens diameter being 9–10 mm., and thickness 4 mm.

2d Stage. Iridectomy.—If the patient is quiet, the forceps are removed, and the iridectomy made in the ordinary manner, but of moderate size.

3d Stage. Laceration of the Capsule.—The attempt is always made to remove with the lens a triangular piece of the anterior capsule. The cystotome is passed down the anterior chamber to the middle of the lower edge of the pupil, and freely incises the capsule as it is drawn from this point upward along the inner pupillary edge. It is then again passed to the central point of the lower pupillary edge, and drawn upward along the outer edge of the pupil, and the triangle completed by a horizontal sweep of the cystotome along the upper border of the lens. This triangle of capsule often comes away with the lens, and lessens greatly the necessity of secondary operations.

4th Stage. Lens Delivery: accomplished by gentle continuous pressure on the cornea at the junction of the middle and lower thirds with a Daviel spoon, and the lens remnants removed by gentle inward and upward pressure of the lower lid on the cornea, the finger being used for the purpose.

Advantages of this modification.—1. The lessened risk of ciliary inflammation as compared with the Graefe-Linear method, and the less probability of corneal suppuration as compared with the corneal flap.

2. The removal of the forceps, after the completion of the cut, avoids all pressure on the eyeball during this critical time.

3. The removal of the capsule triangle greatly lessens the number of secondary operations.

II. *Needle Operations in Cases of Retinal Detachment.*—In my operations I have followed Bowman's plan of tearing the retina with two needles, but have used needles of unequal size—one quite large, the second one very fine—for the double purpose of making a communication between the vitreous chamber and the sub-retinal pouch, and also of allowing the sub-retinal fluid to drain out through the sclerotic opening made by the passage of the large needle.

If the position of the effusion permitted, as was usually the case, the region of the eye punctured has been from a quarter to half an inch behind the cornea, and between the straight muscles; the needles being thrust vertically in toward the centre of the eyeball, passing through the detached retina, and then tearing it by crossing or separating the needles, the forceps being but seldom used. Generally there has been subconjunctival effusion immediately after the puncture; the vitreous humour often showed a considerable amount of cloudiness, but lasting only a short time, and in some instances the retinal tear could be distinctly seen with the aid of an ophthalmoscope. No great amount of irritation followed any of these operations, atropia locally and a pressure bandage being used for forty-eight hours afterwards.

Case I.—Mr. J. E., æt. 43, applied September 3d, 1875. Right eye; cataract of four years' standing, following retinal separation. No light perception; refraction of eye, high grade of myopia. Left eye, myopia $= \frac{1}{3}$. Retinal separation in its entire upper and outer parts. Visual field lost except in a very small upper portion, where he counted the fingers with great difficulty. Separation of eight days' standing, the visual field could only be determined by the finger test, as the amount of vision did not admit of the use of a perimeter. The first and second operations did not produce any change, they being made within one week of each other, as so little irritation existed. The third operation yielded good results. The retinal tear could be now for the first time distinctly seen; also considerable amount of fluid drained from the sclerotic opening immediately after the withdrawal of the needle, followed by low tension of eyeball. I am inclined to believe that the two preceding operations did not tear the retina, as the ophthalmoscope was carefully used to detect it without avail. The patient could read type—Jaeger No. 3. Retinal separation had disappeared, and the visual field was restored. Very little reaction was caused by the puncture, beyond slight vitreous humour cloudiness lasting a very short time. This improvement lasted twelve weeks, when the separation again took place, but in the lower half of the retina. A fourth operation restored vision to reading moderate print. This improvement lasted eight days, when separation took place at the same point. A fifth and sixth operation caused a replacement lasting about eight days after each, when it again reappeared, always now in the lower half. The seventh operation was made on January 8th, 1876, followed by rapid replacement and restoration of vision to reading power Jaeger 3, for distance $V=\frac{14}{100}$, which has lasted up to present time, October 23d, 1876—over eight months. At examination made a few days since, I could detect the separation again commencing in the lower half.

A more discouraging case than this could not be supposed. One eye entirely lost, the second eye reduced to barely light sensibility as counting of the fingers was most imperfectly done, where useful vision has been given for a term extending over a year, and with a prospect of its being still further prolonged.

The reaction from these repeated operations was very slight.

CASE II.—Miss M., æt. 30, applied July 8th, 1875. Left eye: Entire retinal separation of two years' standing. No light perception. High grade of myopia. Right eye: $M=\frac{1}{3}$. Retinal separation upward and outward comprising one-third of retina of two weeks' standing, with entire defect in corresponding visual field. Read Jaeger No. 11.

July 14. Operation on upper outer quarter, with two needles. Great leakage into conjunctival sac.

15*th*. Restoration of visual field. Reads large print.

27*th*. Visual field good. Reads Jaeger 5. Can see the tear in the retina by aid of ophthalmoscope.

31*st*. Improving. Reads Jaeger 3. Good visual field.

August 8. Reads Jaeger 2.

April 6, 1876. Seen M. last time. No retrograde either in visual field or reading power, nor could any separation be detected with the ophthalmoscope. No amount of irritation was caused by the operation.

Another most unpromising case. One eye lost, and all conditions tending to same result in second eye.

In these two cases it was not difficult to decide as to the propriety of an operation. There was all to gain in both of these cases, but I would not be willing, as long as one eye was preserved, to risk the operation on the second eye, for fear of sympathetic trouble; but in cases where vision remained in one eye only, and that in such peril, I think the operation to be strongly indicated. Both Graefe and Bowman, from their experience, concluded that the operation, carefully made, was a safe proceeding. As to permanent results, their experience showed improvement lasting from one month up to several years, in many cases; in others, very little profit, but no serious harm from the operation. It must also be considered that these are desperate cases, where little can be hoped for, from non-interference.

For information concerning the literature of the subject, the reader is referred to Sichel, *Clinique Europeene*, 1850, No. 29. Kittel, *Allgemeine Wiener Medicinische Zeitung*, 1860, No. 23. V. Graefe, *Archiv f. Ophthal.*, vol. ix. p. 85, 1863. Bowman, *Ophthal. Hospital Reports*, May, 1864. L. V. Wecker, Text-book.

III. *Optical Delusions in the Insane—probably caused in some cases by disease of the Macula Lutea.*—The clinical history of this case is interesting from the fact that the optical phenomena were probably caused by disease of the macula, retinitis maculæ; and as these were a most prolific source of annoyance and distress to the person, he considering them originating from a diseased mind, the recognition of their probable source, as being in the macula and not the brain, proved the greatest relief and comfort to the patient.

Mr. C., æt. 59, a victim of self-abuse from twelve years of age up to time of his married life ten years later; also, a moderate user of alcohol. Shortly after his first marriage, owing to anxiety caused by the sickness of his wife, and want of sufficient means of support, he became troubled with mental hallucinations, and was in constant fear of receiving harm from members of his wife's family, owing to his imagined want of care for his wife. This disordered state of mind lasted nine months, during which time his wife died. He then sufficiently recovered to resume his business, and married a second time. Worry from pecuniary troubles caused a return of his old hallucinations for some ten months, when he again recovered and kept well until the death of his second wife, which loss entirely upset his mental powers for some months, then for a year had a comparatively clear mind, followed by an attack of religious excitement, imagining himself to be an Anti-Christ. Gazing for some ten minutes one day on the sun, thinking it to be a divinity, he noticed immediately afterwards a black spot. This condition lasted constantly for two weeks. Then from this spot appeared light scintillations, changing into light circles, and nine months later changing into a face, having a hideous grin, and constantly mocking him. During this time the eyes were sensitive to light, and painful from exposure or any amount of work. From that time up to the present this face has been his constant companion, and is a constant source of terror to him—as he of course attributes its origin to a diseased mental condition, and its continual presence a constant proof of his incurability.

Status Presens of the Eyes.—Right eye, vision $= \frac{20}{70}$. Visual field greatly lessened in extent, particularly in vertical meridian, with small *central scotome*, also sensitive to light.

Ophthalmoscopic Examination.—Atrophic excavation in the temporal side of optic papilla, with a greenish rim around the outer half of the sclerotic foramen, the arteries small and some tortuosity of the retinal veins. The *macula* appears as an *ellipsoid figure filled with distinct black dots;* in some places several of these dots appear to coalesce, forming small black patches. The change is most marked, and would be considered as caused by *inflammation* in the *retina* and *choroid* at this part, (Retinitis Maculæ), and readily accounting for the central scotome.

Left eye shows the same changes that have been described as existing in the right eye.

From the fact of the existence of this marked macula change, with the accompanying central scotome, I felt warranted in telling the patient that most probably the existence of his tormenting companion—the face with the hideous grin—was due to *ocular disease* rather than of brain origin, thereby greatly relieving his distress. Of course it is impossible to speak with certainty in a case of this kind, but at the same time the above explanation seems, under these existing conditions, at least to be probably the correct one.

I have endeavoured to enlarge my experience since meeting with this case, but find that insane patients with optical delusions are the rare exception, and I must content myself at present with the history of this one case.

Art. XVII.—*Extraordinary Case of Urinary Calculi.* By J. R. MacGregor, M.D., of New York City.

The following case is brought to the notice of the profession, under the belief that it presents some rare and remarkable features.

It is not unusual to see in pathological collections, specimens of calculi that are noticeable either for size or number, or perhaps both; but the case about to be narrated may be safely asserted to be, in both the qualities mentioned, as well as some other peculiarities, if not unique, at least extremely uncommon.

I was called in May last to see Mrs. B., aged 63, married, who was suffering from symptoms referable to the bladder, among which, pain and difficulty in urinating were prominent, and accompanied with considerable constitutional disturbance, manifested by fever and nausea. Her general condition was enfeebled, and she had been in poor health for several years. According to her own statement, she had not at any time experienced an attack of kidney colic. I was shown a box containing upwards of three hundred calculi, varying in size from that of an ordinary shot, up to a large bean; these she had passed by the urethra during the past four years. They were of various shapes, and from attrition, had been worn down, presenting facets beautifully polished; many of them assumed a cuboidal form. In colour they varied from a yellowish-brown, to that of fawn mixed with gray, and were more or less mottled.

A vaginal examination revealed the presence of a large number of apparently the same kind of concretions, seemingly occupying nearly the whole cavity of the bladder, and the mass from its bulk pressing down upon the superior wall of the vagina, encroaching upon its calibre, and altering the direction of the urethra so much, that a catheter to be introduced required to be pointed markedly downwards.

Two or three days of appropriate treatment rendered her condition sufficiently comfortable to warrant an operation for extraction; and after a gradual dilatation of the urethra by means of large-sized bougies, which process occupied a period of four days, the blades of a pair of uterine dressing forceps were introduced into the bladder, and a finger of the left hand passed into the vagina as a guide; none of the stones, however, could be seized, and after repeated and protracted efforts to no purpose, the operation for the time was relinquished. The cause of the failure will be apparent in the subsequent history of the case.

The degree of pain and general distress following the attempt at removal so discouraged the patient, that during the whole summer she could